

REMARKS

STATUS OF CLAIMS

Claims 1-6, 10-13, 15 and 16 are now pending in this application. Claims 7-9 and 14 are withdrawn from consideration as being directed to a non-elected invention.

REJECTION OF CLAIMS UNDER 35 U.S.C. § 102

I. Claims 1-5 and 10-12 have been rejected under 35 U.S.C. § 102(b) as being anticipated by Johnson (U.S. Patent No. 5,892,847), for the reasons substantially of record.

The rejections are respectfully traversed.

Johnson is directed to image data compression for reducing the amount of data of an entire image and teaches how to restore, when reproducing the image, the amount of data of the compressed image. Thus, Johnson closely relates to overcoming the difficulties caused by the number of pixels or resolution of images.

In contrast, the invention disclosed in the present application intends to improve the resolution of the signal level per pixel, i.e., the dynamic range or the range of amplitude of a signal. While the system structure of Johnson in block diagram level may appear similar to that of the embodiment of the invention disclosed in the present application, both are, however, completely different from each other in terms of the signal or data dealt with, as well as in objective. More specifically, the invention disclosed in the present application deals with a digital signal immediately after being converted from an analog signal produced by the image sensor. Such a digital signal immediately after being converted from an analog signal produced by the image sensor and dealt with by the present invention would correspond in Johnson to the

signal appearing immediately prior to the encoder 110 (see FIGS. 1 and 2 of Johnson), although on a pixel basis.

Independent claim 1 delineates, *inter alia*:

...
generating a file including the first difference data and a first parameter, the first parameter identifying the first difference data as being calculated using the first image data and the inversely converted second image data...

Independent claim 10 delineates similar subject matter.

The Examiner maintains that Johnson discloses calculating a difference (via element 1010 of Fig. 34) between the information represented by each of the bits of the first image data and the information represented by each of the bits of the inversely converted second image data and outputting the difference as first difference data (Residue ΔX 1012). Next, the Examiner contends that Johnson discloses generating a file including the first difference data by referring to Fig. 34 and Residue ΔX 1012 being input to and output from storage/transmission 1006. The Examiner contends that Residue ΔX 1012 corresponds to numerals 238 and 240 in Fig. 11 and that a first parameter corresponds to the ID # in Fig. 11. Using this interpretation, the Examiner maintains that Johnson discloses the first parameter identifying (via the ID #) the first difference data (corresponding to 238 or 240 via a matching procedure that has an associated ID #) as being calculated using the first image data and the inversely converted second image data (since the ID # is a compact way of representing different data).

However, Johnson discloses that Figs. 34-57 illustrate a preferred embodiment of the Reed Spline Filter 138 which is advantageously used for the first, second and third Reed Spline Filters 148, 225, and 227. *The Reed Spline Filter described in FIGS. 34-57 is in terms of a*

generic image format. In particular the image input data comprises Y image input which corresponds for example to the red, green and blue image data **in the first Reed Spline Filter 148 in the foregoing discussion**. In like manner the outputs of the Reed Spline Filter 138 described as reconstruction values should be understood to correspond, for example, to the R__tau2 miniature 180, the G__tau2 miniature 182 and the B__tau2 miniature 184 of the first Reed Spline Filter 138 (see col.30, lines 37-49 of Johnson).

The reference to the first Reed Spline Filter 148 is quite important since Fig. 4 clearly discloses that this is the first Reed Spline Filter encountered ***for the original source image 100 (corresponding to first image data)*** after being formatted by formatter 146. With regard to the first Reed Spline Filter 148, col. 10, lines 13-27 of Johnson describes:

The first Reed Spline Filter 148, illustrated in more detail in FIG. 6, uses a two-step process to compress the formatted source image 100. ***The two-step process comprises a decimation step performed in block 170 and a spline fitting step performed in a block 172.*** As explained in more detail below, ***the decimation step in the block 170 decimates each color component of red, green, and blue by a factor of two along the vertical and horizontal dimensions*** using a Reed Spline decimation kernel. The decimation factor is called "tau." The R_tau2' decimated data 174 corresponds to the red component decimated by a factor of 2. The G_tau2' decimated data 176 corresponds to the green component decimated by a factor of 2. The B_tau2' decimated data 178 corresponds to the blue component decimated by a factor of 2. (Emphasis added)

That is, each of the color components red, green and blue of the formatted original source image 100 are decimated so that (bit) information for each of the red, green and blue components is lost. As described with respect to Fig. 34, the residue ΔX is computed and stored in storage/transmission 1006. Fig. 11 of Johnson, to which the Examiner refers as disclosing "generating a file including the first difference data and a first parameter", describes an adaptive vector quantizer 134 of Fig. 4. The AVQs 134 are part of stage 3 of the encoder 102 of Fig. 4 of

Johnson, and do not use *the original source image 100 (corresponding to first image data)*. The residues (ΔX) from the first Reed Spline Filter 148 (as well as the second and third Reed Spline Filters) are sent to a storage/transmission (e.g., 1006) *prior to* processing by AVQ 134. Furthermore, the residues of first Reed Spline Filter 148 are different from the residuals disclosed in Fig. 11.

There is no disclosure in Johnson that the residues of the first Reed Spline Filter 148, which uses *the original source image 100 (corresponding to first image data)*, are stored in storage/transmission (e.g., 1006) with a parameter identifying each of the residues as being calculated using the first image data (X) and the inversely converted second image data (X').

As noted in the previous Response, AVQ 134 of Fig. 11 is compressing the residual image (the difference between the reconstructed image and the original image) by comparing an input block with the block patterns in the set of codebooks 214. If a block pattern in the set of codebooks 214 matches or closely approximates the input block, the AVQ 134 replaces the input block pattern with the index. Thus, AVQ 134 compresses the input block information into a list of indexes. The indexes are decompressed by replacing each index with the block pattern (in the set of codebooks 214) that corresponds to each index.

That is, a compressed input block information of the residual image is decompressed by replacing the index with the corresponding block pattern. This is clearly different from storing a parameter (corresponding to the ID #) identifying the (first) difference data (corresponding to the residual image) *as being calculated using the first image data and the inversely converted second image data*.

More specifically, the ID # corresponding to a block pattern in Johnson does **NOT** identify that rU_tau4 residual 238 (or rX_tau4 residual 240) was calculated using rU_tau4 and rU_tau 4'.

Therefore, claims 1-5 and 10-12 are patentable over Johnson.

II. Claims 6, 13, 15 and 16 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Johnson in view of Yi (U.S. Patent No. 6,778,187), for the reasons substantially of record.

Independent claim 6 also delineates, *inter alia*:

...
generating a file including the first difference data and a first parameter, the first parameter identifying the first difference data as being calculated using the first image data and the inversely converted second image data...

Independence claim 13 recites similar subject matter for "a file generating circuit". Yi does not remedy the above-noted deficiency of Johnson with respect to this feature. Therefore, independent claims 6 and 13, as well as dependent claims 15 and 16, are patentable over Johnson and Yi.

III. In view of the above, the allowance of claims 1-6, 10-13, 15 and 16 is respectfully solicited.

CONCLUSION

Should there be any outstanding matters that need to be resolved in the present

application, the Examiner is respectfully requested to contact Edward J. Wise (Reg. No. 34,523) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

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Respectfully submitted,

By 

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